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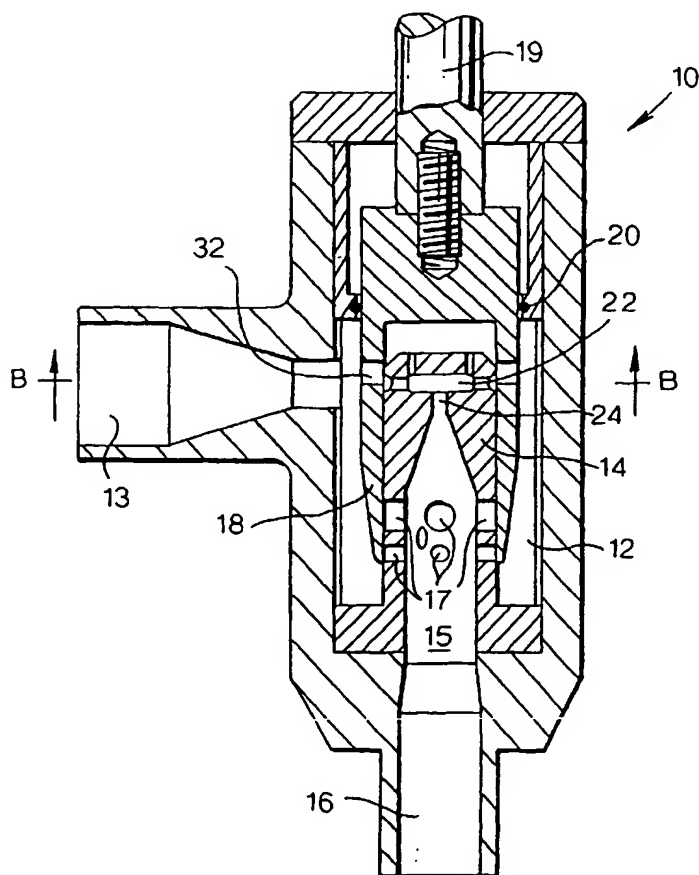
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(54) Title: VALVE ASSEMBLY



(57) ~~Abstract:~~ A valve assembly (10) comprises a valve stem (14) with a bore (15) and radial apertures (17), and a sleeve (18) closed at one end and slidable over the valve stem (14) to obstruct the apertures (17). At the end of the valve stem opposite the outlet end, the valve stem (14) defines a fluidic vortex chamber (22) with both tangential inlets (28) and non-tangential peripheral inlets (26), and with an axial outlet (24) communicating with the bore (15). The sleeve (18) defines at least one radial port (32) near its closed end. The valve assembly operates in a conventional fashion except when approaching closure. Once the last of the apertures (17) in the valve stem has been closed, the only flow path is through the fluidic vortex chamber (22). Further movement of the sleeve (18) alters the distribution of the flow between the non-tangential inlets (26) and the tangential inlets (28), so adjusting the strength of the fluidic vortex and the resistance to fluid flow. The valve assembly (10) suppresses erosive and cavitation wear of the valve mechanism, and can provide a wide range of flow modulation.